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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Paper No. 030404

Application Number: 09/870,014
Filing Date: May 31, 2001
Appellant(s): BRIAND ET AL.

Roland E. Long, Jr.
<u>For Appellant</u>

EXAMINER'S ANSWER

MAILED
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GROUP 1700

This is in response to the appeal brief filed 19 December 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The examiner agrees with the appellant's grouping of claims, as set forth in the appellant's brief.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

No prior art is relied upon by the examiner in the rejection of the claims under appeal.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-2, 7-9, 15-16, and 18-25 are rejected under 35 U.S.C. § 103. This rejection is set forth in the prior Office Action dated 16 July 2003.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 7-9, 15, 22, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamasaki (U.S.P. 4,507,540) in view of Steen (U.S.P. 4,167,662) and Yenni et al. (U.S.P. 2,753,427), Cherne et al. (U.S.P. 4,871,898), or Galantino et al. (U.S.P. 4,749,841).

Hamasaki teaches a process for welding metal workpieces, such as steels or stainless steels, by producing a welded joint between the edges of the workpieces in which the welded joint is produced by using a laser beam and an electric arc. The arc has a plasma stream and is produced by a MIG welding device. During the welding operation at least a part of the welding zone and joint is shielded by a gas mixture of

argon and helium (see U.S.P. 4,507,540; particularly Figure 3; column 1, lines 7-18, 34-36; column 2, lines 20-50; column 3, lines 48-51)

Hamasaki does not teach the addition of other gases to the argon/helium mixture, compositions of such mixtures, or that TIG electrodes can be used in the hybrid process.

Steen teaches a hybrid welding process in which TIG or MIG electrodes can be used (see U.S.P. 4,167,662; particularly column 4, lines 63-66).

Yenni et al. teach a gas-shield metal arc welding process in which a shielding gas with a composition of 40-80% helium, 3-5% carbon dioxide, and balance argon is used to produce a quiet, spatter-free arc that deposits a satisfactory weld bead (see U.S.P. 2,753,427; particularly column 1, lines 15-20, 36-46).

Cherne et al. teach a gas metal arc welding process in which a shielding gas with a composition of 2-12% carbon dioxide, 20-45% helium, and balance argon is used to provide an improved process that effectively welds carbon and low alloy steels with greater efficiency and lower cost (see U.S.P. 4,871,898; particularly column 1, lines 58-62; column 2, lines 1-15).

Galantino et al. teach an arc welding method that uses a shielding gas composition of 14-25% helium, 1-4% carbon dioxide, and balance argon to substantially reduce energy input, enhance metal deposition rates, and avoid significant alloy loss due to oxidation or evaporation during welding of stainless steels, low alloy steels, and nickel based alloys (see U.S.P. 4,749,841; particularly column 2, lines 10-33; column 3, lines 15-25).

It would have been obvious to one of ordinary skill in the art to made the electrode taught by the process described above a TIG electrode, as taught by Steen, as opposed to a MIG electrode, as taught by Hamasaki, because of the art recognized functional equivalence of MIG and TIG electrodes (i.e. both are suitable electrodes for a hybrid welding process). It would have been obvious to modify the process of Hamasaki by the teachings of Yenni et al. in order to produce a quiet, spatter-free arc that deposits a satisfactory weld bead, as taught by Yenni et al. It would have been obvious to modify the process of Hamasaki by the teachings of Cherne et al. in order to provide an improved process that effectively welds carbon and low alloy steels with greater efficiency and lower cost, as taught by Cherne et al. It would have been obvious to modify the process of Hamasaki by the teachings of Galantino et al. in order to substantially reduce energy input, enhance metal deposition rates, and avoid significant alloy loss due to oxidation or evaporation during welding of stainless steels, low alloy steels, and nickel based alloys, as taught by Galantino et al.

Claims 16, 18, 19, and 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Hamasaki (U.S.P. 4,507,540) in view of Steen (U.S.P. 4,167,662) and Yenni et al. (U.S.P. 2,753,427), Cherne et al. (U.S.P. 4,871,898), or Galantino et al. (U.S.P. 4,749,841) as applied to claims 1, 2, 7-9, 15, 22, 23, and 25 above, and further in view of Beyer et al. (U.S.P. 5,821,493).

The former references teach the process described above in section 3. However,

these references do not teach that the arc creates a plasma, that the welded joint is a vehicle body element, that workpieces can have different thicknesses, or that the operation forms a tube.

Beyer et al. teach a hybrid laser and arc process that is used to make tubes and components for vehicle bodies. The arc of the process forms a plasma and uses a TIG type electrode. Beyer et al. also teaches that the workpieces can be of different thickness and that this process allows the elimination of preparation and positioning steps (see U.S.P. 5,821,493; particularly column 1, lines 13-17, 21-65).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made that the process described above could be used to weld workpieces of different thickness, make tubing, and produce components for vehicle bodies. One would have been motivated to use this process for such operations in light of the teachings of Beyer et al. that such a hybrid process would allow the elimination of preparation and positioning steps.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamasaki (U.S.P. 4,507,540) in view of Steen (U.S.P. 4,167,662) and Yenni et al. (U.S.P. 2,753,427), Cherne et al. (U.S.P. 4,871,898), or Galantino et al. (U.S.P. 4,749,841) as applied to claims 1, 2, 7-9, 15, 22, 23, and 25 above, and further in view of Cook (U.S.P. 2,790,656).

The former references teach the process as described above in section 3. However, these references do not teach that the process can be used to weld dissimilar metals.

Cook teaches a process of welding dissimilar metals to provide a strong joint by using a gas metal arc welding process with a consumable or non-consumable electrode (see U.S.P. 2,790,656; particularly column 1, lines 15-23; column 2, lines 38-43; column 3, lines 3-5; column 4, lines 42-47).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the process described above by the teachings of Cook. One would have been motivated to do so in order to use the process to weld dissimilar metals and provide a strong joint between them, as Cook teaches.

Claims 1, 2, 7-9, 15, 22, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamasaki (U.S.P. 4,507,540) in view of Steen (U.S.P. 4,167,662) and Galantino (U.S.P. 4,902,866).

Hamasaki teaches a process for welding metal workpieces, such as steels or stainless steels, by producing a welded joint between the edges of the workpieces in which the welded joint is produced by using a laser beam and an electric arc. The arc has a plasma stream and is produced by a MIG welding device. During the welding operation at least a part of the welding zone and joint is shielded by a gas mixture of argon and helium (see U.S.P. 4,507,540; particularly Figure 3; column 1, lines 7-18, 34-36; column 2, lines 20-50; column 3, lines 48-51)

Hamasaki does not teach the addition of other gases to the argon/helium mixture, compositions of such mixtures, or that TIG electrodes can be used in the hybrid process.

Steen teaches a hybrid welding process in which TIG or MIG electrodes can be used (see U.S.P. 4,167,662; particularly column 4, lines 63-66).

Galantino teaches a gas metal arc welding process that uses a shielding gas composition of 69-81% argon, 20-29% helium, and 1-4% oxygen that is suitable for welding stainless steels and low alloy steels and for pulse spray transfer (see U.S.P. 4,902,866; particularly column 1, lines 5-8; column 4, lines 65-68; column 5, lines 1-2).

It would have been obvious to one of ordinary skill in the art to made the electrode taught by the process described above a TIG electrode, as taught by Steen, as opposed to a MIG electrode, as taught by Hamasaki, because of the art recognized functional equivalence of MIG and TIG electrodes (i.e. both are suitable electrodes for a hybrid welding process). It would have been obvious to modify the process of Hamasaki by the teachings of Galantino in order to provide a shielding gas that is suitable for welding stainless steels and low alloy steels and for pulse spray transfer, as taught by Galantino.

Claims 16, 18, 19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamasaki (U.S.P. 4,507,540) in view of Steen (U.S.P. 4,167,662) and Galantino (U.S.P. 4,902,866) as applied to claims 1, 2, 7-9, 15, 22, and 24 above, and further in view of Beyer et al. (U.S.P. 5,821,493).

The former references teach the process described above in section 6. However, these references do not teach that the arc creates a plasma, that the welded joint is a vehicle body element, that workpieces can have different thicknesses, or that the operation forms a tube.

Beyer et al. teach a hybrid laser and arc process that is used to make tubes and components for vehicle bodies. The arc of the process forms a plasma and uses a TIG type electrode. Beyer et al. also teaches that the workpieces can be of different thickness and that this process allows the elimination of preparation and positioning steps (see U.S.P. 5,821,493; particularly column 1, lines 13-17, 21-65).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made that the process described above could be used to weld workpieces of different thickness, make tubing, and produce components for vehicle bodies. One would have been motivated to use this process for such operations in light of the teachings of Beyer et al. that such a hybrid process would allow the elimination of preparation and positioning steps.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamasaki (U.S.P. 4,507,540) in view of Steen (U.S.P. 4,167,662) and Galantino (U.S.P. 4,902,866) as applied to claims 1, 2, 7-9, 15, 22, and 24 above, and further in view of Cook (U.S.P. 2,790,656).

The former references teach the process as described above in section 6. However, these references do not teach that the process can be used to weld dissimilar metals.

Cook teaches a process of welding dissimilar metals to provide a strong joint by using a gas metal arc welding process with a consumable or non-consumable electrode (see U.S.P. 2,790,656; particularly column 1, lines 15-23; column 2, lines 38-43; column 3, lines 3-5; column 4, lines 42-47).

It would have been obvious to one of ordinary skill in the art at the time that the applicant's invention was made to have modified the process described above by the teachings of Cook. One would have been motivated to do so in order to use the process to weld dissimilar metals and provide a strong joint between them, as Cook teaches.

(11) Response to Argument

The applicant argues that the examiner has taken a position that it would be "obvious to try" an arc welding technique for a hybrid welding process. The applicant argues that it is nonobvious to apply arc welding teachings, particularly those regarding shielding gas mixtures, to hybrid welding processes.

The examiner notes that Hamasaki teaches that the shielding gas for the laser portion of the welding process can be composed of helium gas or helium and oxygen gas while the shielding gas for the arc (MIG) portion of the welding process can be composed of carbon dioxide, carbon dioxide with argon, carbon dioxide with helium, or helium and argon. (see U.S.P. 4,507,540; particularly column 2, lines 36-52). In essence, Hamasaki teaches that shield gases for the laser and arc portions may be different.

The examiner further notes that the claim language of claim 1 is broad. Particularly, in lines 7-9 of claim 1, the language "...shielding at least one part of a welding zone comprising at least one part of said welded joint during welding..." is used for citing the location of the ternary shield gas. This language is broad and does not cite that the shield gas must be the same for the arc and laser portions of the process. Nor does claim 1 cite that the arc and laser impinge at the same point or area of the weld

joint. Therefore, the prior art rejections read upon claim 1, in its broadest sense, because the ternary gas teachings of Yenni et al., Cherne et al., Galantino et al., and Galantino may used to modify the arc shielding gas of Hamasaki. This would produce a hybrid welding operation that uses a laser with a shield gas taught by Hamasaki and an arc with a shield gas taught by Yenni et al., Cherne et al., Galantino et al., or Galantino.

The applicant argues that Steen does not teach TIG or MIG welding in hybrid laser-arc welding processes, citing that Steen teaches that the "electrode system may be similar to that used in MIG or TIG." (see U.S.P. 4,167,662; column 4, lines 63-66). The applicant apparently reasons that because the electrode system is only "similar" to that of TIG or MIG that they are not the same or that they the same features as MIG or TIG processes. The previous office action notes in paragraph 3 that Steen teaches the equivalence of using MIG electrodes (consumable electrodes) and TIG electrodes (nonconsumable electrodes) for hybrid welding processes. (see U.S.P. 4,167,662; column 4, lines 63-66). Steen teaches the use of these consumable and nonconsumable electrodes with an inert gas shield, which are the basic features of MIG and TIG welding processes. (see U.S.P. 4,167,662; Figures 1-3). Therefore, Steen properly teaches the equivalence of consumable and nonconsumable electrodes for hybrid welding processes.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

K.M.
March 5, 2004

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